

WHAT IS CLAIMED IS:

1. A method for recombinantly producing functional ataxia-telangiectasia (ATM) protein, comprising:

providing a viral vector comprising a gene encoding the ATM protein operably linked to a promoter;

infecting mammalian cells with said viral vector, wherein said mammalian cells produce functional ATM protein; and

isolating said functional ATM protein produced by said mammalian cells.

2. The method of Claim 1, wherein said viral vector comprising a gene encoding the ATM protein operably linked to a promoter is a vaccinia viral vector

3. The method of Claim 1, wherein said viral vector comprising a gene encoding the ATM protein operably linked to a promoter is a variola viral vector.

4. The method of Claim 1, wherein said viral vector comprising a gene encoding the ATM protein operably linked to a promoter is pSCAT

5. The method of Claim 1, wherein said promoter is a synthetic early/late viral promoter.

6. The method of Claim 1, wherein said mammalian cells are human cells.

7. The method of Claim 1, wherein said mammalian cells are HeLa cells.

8. The method of Claim 1, wherein said mammalian cells are ATM-deficient cells.

9. The method of Claim 1, wherein said mammalian cells are L3 cells.

10. The method of Claim 8, further wherein said ATM-deficient cells producing said functional ATM protein exhibit regain of ATM function.

11. The method of Claim 1 wherein isolating said functional ATM protein comprises binding an anti-ATM antibody to said ATM protein.

12. The method of Claim 1, where said gene encoding the ATM protein is modified to comprise a FLAG epitope.

13. The method of Claim 12, wherein isolating said functional ATM protein comprises binding an antibody specific for the FLAG epitope to said ATM protein.

14. The method of Claim 1, wherein said functional ATM protein is produced at a level of greater than 2 ug substantially purified ATM protein per 300 grams fresh weight of host cells or host tissue.

5 15. The method of Claim 1, further wherein said functional ATM protein is capable of phosphorylating ATM substrates.

16. The method of Claim 15, wherein said substrates comprise p53 and PHAS-1.

17. A method for recombinantly producing a high yield of functional ataxia-telangiectasia (ATM) protein, comprising:

10 providing a vaccinia viral vector comprising a gene encoding the ATM protein operably linked to a promoter;

infecting mammalian cells with said vaccinia viral vector, wherein said mammalian cells produce functional ATM protein; and

15 isolating said functional ATM protein produced by said mammalian cells.

18. The method of Claim 17, wherein said high yield of functional ATM protein is greater than 2 ug substantially purified ATM protein per 300 grams fresh weight of mammalian cells.

19. The method of Claim 17, wherein said mammalian cells are human cells.

20 20. The method of Claim 17, wherein said isolating said functional ATM protein comprises binding an anti-ATM antibody to the ATM protein.

21. The method of Claim 17, where said gene encoding the ATM protein is modified to comprise a FLAG epitope.

25 22. The method of Claim 21, wherein isolating said functional ATM protein comprises binding an antibody specific for the FLAG epitope to said ATM protein.